

light energy includes the steps of fitting the light source with a mask; wherein said mask has at least one first portion that is substantially transmissive of the spectrum of light required for curing the material, and at least one second portion which is non-transmissive of at least a portion of the spectrum of light required for curing the material;

such that the stress occurring over the entire composite-to-tooth interface is effectively divided into a series of incremental stresses over composite-to-composite sub-interfaces, thereby substantially preventing the overall polymerization stress from being transmitted to the composite-to-tooth interface or being passed through the interface into the tooth structure.

RESPONSE

Claims 1-25 are pending in this application. The Examiner has rejected all of the claims under 35 USC 102 or 103 as being unpatentable over a number of patents. In response, the Applicant has provided new claim 26, and has cancelled original claims 1-25. The Applicant believes that new claim 26 is fully allowable over the art of record.

The Examiner has cited a number of patents which variously show examples of segmental curing, curing with different light intensities, curing with different light sources, and the like. All of the art cited by the Examiner, and indeed all of the prior art to the present invention is deficient in that all of the prior inventions effectively only provide one mass of chemically homogeneous material being exposed to a relatively homogeneous light source resulting in a relatively homogeneous curing rate throughout the material. The present invention, as embodied in claim 26 is a method of curing a photo-polymerizable composite dental material "such that the stress occurring over the entire composite/tooth interface is effectively divided into a series of incremental stresses over composite-to-composite subinterfaces, thereby substantially preventing the overall polymerization stress from being transmitted to the composite-to-tooth interface or being passed through the interface into the tooth structure." Therefore, the method according claim 26 can be understood as dividing the stress occurring over the entire composite-

to-tooth interface into a series of incremental stresses over the subinterfaces. This prevents the overall polymerization stress from being transmitted to the tooth-composite interface or passing through to the tooth structure. This feature is distinguished over other sequential curing techniques, such as soft-start curing, pulse curing or the like. Support for this language which is found in new claim 26 is contained in the specification as, filed on page 5.

Further, claim 26 recites that the sequential curing is effected by a mask placed over the light source. The Examiner has stated that the reference to Boutoussov discloses a mask for segmental curing. The Applicant respectfully disagrees. Boutoussov discloses a mask to make a circular pattern and this does not teach or suggest dividing the overall stress of the composite material into a series of incremental stresses in the composite itself. Boutoussov is simply an example of having light beams of different intensity and energy distribution. Boutoussov discloses, teaches or suggests nothing of segmental curing of a dental material. Again, Boutoussov, and indeed all of the art of record discloses that one mass of chemically homogenous material is exposed to a relatively homogenous light source resulting in a relatively homogenous curing rate throughout the material. This is in direct contrast to the invention as recited in claim 26, which clearly indicates segmental curing.

The reference to Crawford also discloses nothing about segmental curing induced in a dental material. As noted in Crawford, column 3, it is the primary aim of that invention "to produce substrates containing a plurality of cylindrical features whose boundaries are defined by a discontinuity of refractive indices wherein the index of refraction within the cylindrical features is greater than the index of refraction at the boundaries." Again, this teaches nothing about reducing stress in a dental composite material.


The reference to Puvilland also teaches one mass of material being exposed to a relatively homogenous light source, and will thereby result in a relatively homogenous curing rate throughout the material. Similarly, the reference to Ostler discloses a similar method of curing

which uses power modulation. The reference to Lubbers teaches an arrangement of light sources, and again teaches nothing about segmental curing in a dental material.

In conclusion therefore, the Applicant believes that claim 26 is fully allowable over the art of record. None of the art of record teaches, discloses, or suggests the segmental curing technique using a mask and resulting in reduced stresses being transferred to a tooth structure. Therefore, the Applicant believes that claim 26 is in condition for allowance.

Therefore, the Applicant respectfully requests that the Examiner enter the forgoing amendment to the claims and to issue a formal Notice of Allowance for claim 26. Should the Examiner care to discuss any of the foregoing in greater detail, the undersigned attorney would welcome a telephone call.

Respectfully submitted,


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